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# West American Scientist.

*A popular monthly review and record for the Pacific Coast.*

CONTENTS.


| | | PAGE |
|---|---|---|
| Improved Soft-Shell Walnut | *Frontispiece.* | |
| The English Walnut | | 251 |
| The Walnut and Its Culture | *L. C. Cummins.* | 252 |
| Revision of the Bombylid Genus Aphoebantus | *D. W. Coquillett.* | 254 |
| The Convolvulus—A Poem | *Mrs. E. E. Orcutt.* | 264 |
| Notes on Planting | *Miss K. O. Sessions.* | 265 |
| Apricots | | 268 |
| Contributions to West American Mollusca.—II. | *C. R. Orcutt.* | 269 |
| Phacelia Companularia | | 270 |
| Letter from Dr. Geo. Engelmann to Dr. C. C. Parry | | 271 |
| Cobœa Scandens | *Dorothy Lincoln.* | 272 |
| Weasels as Gopher and Squirrel Exterminators | *L. C. Cummins.* | 272 |
| Plantæ Culteratæ Exsiccatæ | | 273 |
| A Woodland Scene—A Poem | *Mrs. E. E. Orcutt.* | 274 |
| San Francisco Microscopical Society | *William E. Loy.* | 275 |
| California Field Notes | *C. R. Orcutt.* | 276 |
| Library Catalogue | | 276 |


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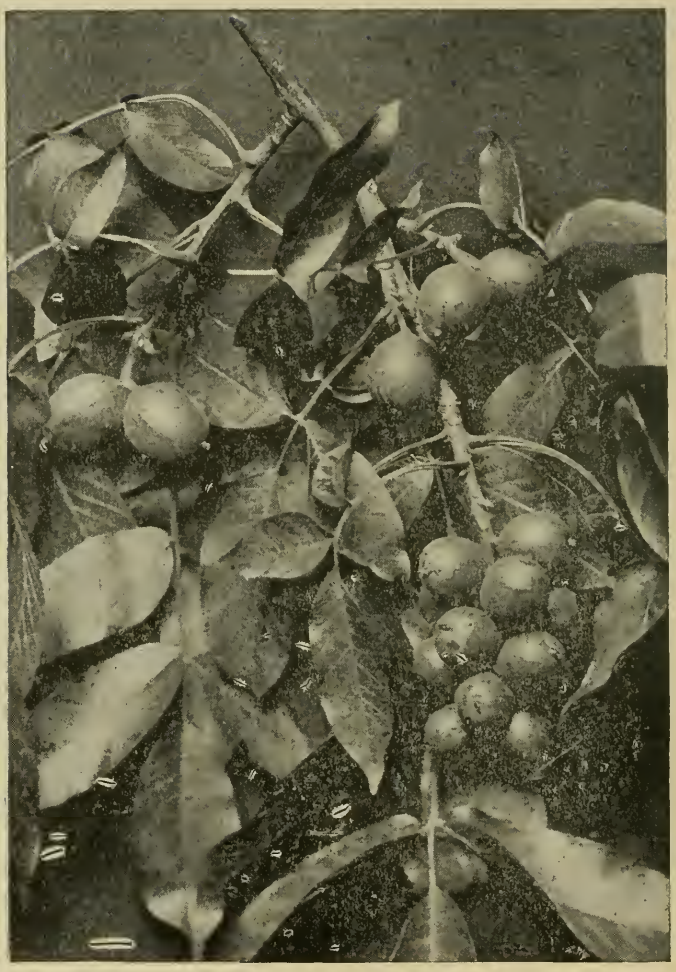

Improved Soft-Shell Walnut.

## *THE ENGLISH WALNUT.*

Before planting a walnut orchard select good, rich, deep valley soil, with an abundance of available water. Plant about forty feet apart—twenty-seven trees to the acre. An equal number of some other kind of fruit tree may be planted between if desired. At eight years of age the improved varieties of walnuts are estimated to yield one hundred pounds to the tree, which at present market prices are worth ten to fifteen cents per pound. But if you can't market them readily, you have the whole year in which to crack them!

Juglans regia is the botanical name of our English walnut or the Madeira nut of commerce, and many cultural varieties have been originated. In California have originated a number of so-called hard and soft shelled varieties. Some strongly advocate the hard shell varieties; others advance claims for the supremacy of the soft shell, which is now gaining in popular favor, especially in Southern California, where it is much more largely propagated than the other sorts.

The soft shell walnut originated in the orchard of Joseph Sexton, of Santa Barbara, and Geo. W. Ford has since secured by selection his improved soft shell, which has proved very prolific and profitable, especially in Orange county. By courtesy of Mr. G. W. Ford, of Santa Ana, California, we give an illustration of his improved variety. The following notes on the culture of this variety is extracted from an essay by Mr. Ford, read before the Thirteenth State Fruit Growers' Convention:

My improved soft shell nuts took the premium at the last Downey fair. I had about one-third of a bushel there, and they averaged twenty-four to the pound. Last year a well-known fruit grower at Tustin raised some soft shells which ran as low as eighteen nuts to the pound.

I plant my walnuts in the nursery rows four feet apart by one foot apart in the row, and do not believe in planting nursery stock of any kind too close. Certainly cheaper trees can be grown by that method, but I have yet to find a stunted tree that ever gave good satisfaction when planted in an orchard.

In planting trees in an orchard, first of all plow the ground deep, then go over it with a harrow or a pulverizer. Dig large and deep holes; plant two or three inches deeper than the trees grew in the nursery; lean them to the prevailing summer winds and you will not have to stake the trees to make them grow straight. Press the soil firmly around the roots, and if not very moist give each tree five or

ten gallons of water, which is sufficient to settle the ground firmly around the roots. Cultivate your orchard to the depth of four or five inches. If the soil is moist enough to keep the tree in good growing condition during the summer months, irrigation is not necessary; but to make a first-class walnut, in size and in the fullness of kernel, if the ground is not naturally moist enough, artificial means will have to be adopted.

My improved soft shell walnut commences to bear at four years from the seed; at six years my trees average fifty pounds of nuts to the tree, while some went as high as seventy-five pounds; at seven years, they averaged ninety-six pounds, and at eight years old, averaged as high as one hundred and twenty-five pounds, while some of the largest trees bear one hundred and fifty pounds of the finest walnuts I have ever seen.

## *THE WALNUT AND ITS CULTURE.*

The walnut is a genus of beautiful trees of the natural order Juglandaceæ, named Juglans from Jovis, the heathen God, and glans a nut. The two most widely known of North American species are Juglans nigra (the black walnut) and Juglans cinerea (the butter nut). But the variety to which we wish to call particular notice, and which is attracting attention among fruit growers in Southern California, is Juglans regia, the common English walnut or Madeira nut. It is classed among the hardy deciduous trees and is a native of Persia. It was introduced into England in 1562, thence distributed over a considerable portion of the globe, wherever the climate and soil is suitable. It is a lofty tree with large spreading branches. Its foliage resembles that of the ash, and the leaves give forth a fine balsamic odor when bruised. By bruising and rubbing on the skin they are said to be a sure cure for the itch. Placed in wardrobes they prevent the ravages of moths. An excellent pickle and a kind of ketchup are made from the unripe fruit. Just before they are ripe they are much used in France with vinegar, salt, pepper and shallots. Walnut oil is a commercial product of Persia and some parts of France, but has attained no proportions in this country. The timber of all kinds of walnuts is very valuable, that of the black walnut sometimes bringing fabulous prices.

In California the English walnut is planted in orchard form for the purpose of raising nuts for the market, and the tree also has special value for shade and a great many streets and avenues are lined with this magnificent tree. Where shade is needed during the

summer and sunlight in winter this tree is found always satisfactory. It makes a splendid growth in California and has been known to have a spread of sixty feet in less than twenty years. The English walnut has proved very profitable along the coast in this state, but at the same time a great many fine groves in the interior give promise of heavy yields. It does best where a deep, rich, moist and loamy soil is to be found, but is doing very well in this climate where the soil is less favorable. Where water is to be had and irrigation is carried on splendid walnuts can be raised on any of the foothills and uplands, but moisture must be had, and a dry and neglected place will not do for the walnut.

The trees are propagated from the seed, which usually come true, being first planted about a foot apart in the nursery row. (The month of January is best for planting). When the seedlings are one year old they may be transplanted into orchard form, and should be set from forty to sixty feet apart each way. Some orchardists advocate leaving the walnut tree in the nursery row until it attains the age of three to five years, but experience will soon show the fallacy of this operation. On the other hand if the seed is planted in orchard form and the seedling never molested, better results will undoubtedly be attained.

Some experimenting has been done at different times in the way of grafting and budding the walnut and the result has well repaid the trouble as several new varieties have been secured that are improvements on the old sort. One new variety that has come into prominent notice is Ford's Improved Soft Shell, which, without doubt, has more excellent qualities than any other. The kernel is of excellent flavor, firm, and always fills the shell well, and is a good keeper as well as a good shipper. Of other varieties we quote from Wickson's "California Fruits."

Common English Walnut:—This is the ordinary English walnut of commerce and is considered very desirable for its shipping qualities, being medium hard shelled, The tree is not as reliable a bearer as the newer sorts and for that reason is not as widely planted as some others.

Santa Barbara Soft Shell:—The soft shell is a little later starting in the spring than the common nut, and blooms about ten days later. It fruits at from four to six years from seed, and usually produces a full crop every year.

This variety is not as strong a grower as the common walnut, and more trees can be placed to the acre, and more nuts can be produced. The kernel is white and very fine. The shells are thin and

break very easily, but cannot be shipped any reasonable distance without damage.

PROEPARTURIENS OR DWARF PROLIFIC:—A choice French variety that has proved itself to be worthy of cultivation in California. It is not truly what its name implies, not being a regular dwarf nor such an early bearer, but the fruit is of an excellent quality and is always in demand where it is known.

PERSIAN WALNUT OR KAGHAZI:—Is very much larger than the ordinary kinds and thin shelled. The tree is late in blooming and therefore is especially good for places that are in danger of frosts.

There are a few other varieties that will no doubt prove valuable in time, but are not worth while describing at present.

The walnut tree is usually headed at a height of six to eight feet, and requires considerable attention in the way of forming a head for the first three or four years. The tree is naturally of spreading habit but if it is trained with an upward tendency more strength can be secured. *L. C. Cummins.*

## *REVISION OF THE BOMBYLID GENUS APHOEBANTUS.*

In the May number of the *Canadian Entomologist* for the year 1886 I gave descriptions of all the species of Aphoebantus (five in number) then known to occur in North America. Since the publication of that paper the Baron Osten Sacken has described six new species from this region, three of which occur in the United States (Biologia Centrali Americana, Part Diptera). In Southern California I have collected specimens belonging to twelve as yet undescribed species, making a total of twenty-three species now known to occur in this country. The following table will aid in identifying the species which occur in the United States. Osten Sacken's Aphoebantus rattus from Texas is unknown to me in nature, and I have given it a place in the accompanying table in accordance with his published description; all the other species of this table are represented in my collection. I have included in this table my Eucessia rubens, which might be mistaken for an Aphoebantus, although lacking the long, style-like prolongation of the third antennal joint:

1. Ground color of the abdomen black..... 2
   Ground color of the abdomen yellow.....13
2. Thorax with two, abdomen with one white tomentose dorsal vittae; pile and tomentum of the face white; styliform portion of third antennal joint once and a fourth times as long as the thickened basal part.....VITTATUS Coq.
   Thorax and abdomen destitute of white tomentose dorsal vittae..... 3

3. Proboscis never projecting more than the length of its labellæ beyond the oral margin..... 4
   Proboscis projecting half its length beyond the oral margin; abdomen with black tomentum, pile of face yellow and white.....LITUS Coq.
4. Front with sub-erect pile, its tomentum when present, sparse. 5
   Front destitute of sub-erect pile, densely white tomentose, pile and tomentum of face white, styliform portion of the third antennal joint two-thirds as long as the thickened basal part..... PAVIDUS Coq.
5. Pile of face white or yellowish white..... 9
   Pile of face wholly golden yellow..... 6
   Pile of face black, that below sometimes reddish..... 7
6. Styliform portion of the third antennal joint equal in length to the thickened basal part, scutellum and hind femora provided with bristles.....CAPAX n. sp.
   Styliform portion of the third antennal joint less than one-third the length of the thickened basal part.....RATTUS O. S.
7. Abdomen with crossbands of black tomentum..... 8
   Abdomen destitute of crossbands of black tomentum; face sparse tomentose, hind femora with a few bristles but no long hairs below .....TARDUS n. sp.
8, Hind femora with long hairs besides the bristles below, face sparse yellowish tomentose.....DESERTUS n. sp.
   Hind femora with bristles but no long hairs below, face destitute of tomentum, abdomen with crossbands of black tomentum .....SCRIPTUS n. sp.
9. Hind femora with bristles on the lower surface.....21
   Hind femora with long hairs but no bristles on the under surface.....10
10. Abdomen destitute of black tomentum .....11
   Abdomen with crossbands of black tomentum, styliform portion of the third antennal joint nearly twice as long as the thickened basal part.....CARBONARIUS O. S.
11. Styliform portion of the third antennal joint at least two-thirds as long as the thickened basal part.....18
   Styliform portion less than one-third as long as the thickened basal part.....RATTUS O. S.
12. Styliform portion of the third antennal joint equal in length to the thickened basal part.....14
   Styliform portion twice as long as the thickened basal part; dorsum of abdomen rather densely clothed with long white or yellowish white pile.....22
13. Abdomen with a white tomentose dorsal vittae, upper part of the face bare, pile of front disposed in two stripes.....
   .....EUCESSIA RUBENS Coq.
   Abdomen destitute of a white tomentose dorsal vittae, upper part of the face pilose, pile of front not disposed in stripes..
   .....VARIUS n. sp.
14. Abdomen with crossbands of black tomentum, these sometimes interrupted .....15
   Abdomen destitute of black tomentum .....16

15. Black tomentose crossbands of abdomen interrupted in the middle ..... 17
    Black tomentose crossbands entire, never interrupted in the middle ..... BREVISTYLUS n. sp.
16. Hind margin of the scutellum opaque, covered with tomentum ..... 19
    Hind margin of the scutellum polished black and destitute of tomentum except in the middle ..... CONURUS O. S.
17. Hind margin of the scutellum polished black and destitute of tomentum except in the middle; front destitute of tomentum ..... INTERRUPTUS n. sp.
    Hind margin of the scutellum opaque and clothed with tomentum, front sparse whitish tomentose ..... MIXTUS n. sp.
18. Styliform portion of the third antennal joint as long as the thickened basal part; tibiæ yellow; length of body 8 to 9 mm ..... MARCIDUS n. sp.
    Styliform portion only two-thirds as long as the thickened basal part; tibiæ black; length of body 3 to 6 mm. (male) ..... PAVIDUS Coq.
19. Pile of front white, or yellowish white ..... 20
    Pile of front black, hind femora with bristles but no hairs below ..... CERVINUS Lw.
20. Hind femora with several hairs besides the usual bristles below, hypopygium of the male only one-half longer than the last abdominal segment ..... SQUAMOSUS n. sp.
    Hind femora with a few bristles but no long hairs below, hypopygium of the male unusually large, over one-half as long as the abdomen ..... ABNORMIS n. sp.
21. Wings, except the subcostal cell, wholly hyaline ..... 12
    Wings with the costal cell, bases of first and second basal cells, and of the anal and axillary cells, brownish; femora reddish brown ..... FUMIDUS n. sp.
22. Crossbands of black tomentum of abdomen of female very distinct and at least six times as broad as those of white tomentum ..... MUS O. S.
    Crossbands indistinct and scarcely any wider than those of white tomentum ..... HIRSUTUS Coq.

APHOEBANTUS VARIUS n. sp.—Female. Head black, front gray pollinose, sparse short white pilose, yellowish tomentose, that on the sides below white; face gray pollinose, white tomentose and sparse short white pilose. Antennæ black, third joint over twice as long as the first two united, the styliform portion slightly over one-half as long as the thickened basal part. Proboscis not projecting beyond the oral margin. Occiput white tomentose, that on the upper part yellowish. Thorax black, yellowish tomentose, that on the sides and anterior end white; short sparse white pilose, the bristles also white; pleura dense white pilose and tomentose. Scutellum black, rounded behind, yellowish tomentose, a spot of white tomentum each side near the base; the usual bristles white. Abdo-

men yellow except sometimes a light brownish spot in middle of segments 2, 3 and 4, middle of segment 5 and greater portion of 6 and 7; hind margins of segments 2, 3 and 4 usually white; tomentum of the abdomen pale yellowish, that on the first segment, on hind margins of the remaining segments, and on sides of abdomen near the base, white; pile of abdomen white, very sparse and short, longer and more abundant on the sides; venter pale yellow, white tomentose. Legs light yellow, the front femora laregly brown, tomentum and bristles white, hind femora each with 3 or 4 bristles but no long hairs below. Wings wholly hyaline. Knob of halteres sulphur yellow, the stalk white.

Male, same as the female, the eyes being as widely separated on the front; hypopygium very small.

Length 3.5 to 5 mm. San Diego county, Cal. Three males and five females in May.

APHOEBANTUS PAVIDUS Coquillett.—Female. Black. Front densely white tomentose, destitute of erect pile; face densely white tomentose and sub-depressed white pilose. Proboscis not projecting beyond the oral margin. Antennæ with the styliform portion of the third joint two-thirds as long as the thickened basal part. Occiput white tomentose. Thorax in front white tomentose, elsewhere yellowish tomentose, the bristles also yellowish; pleura gray pollinose, its pile and tomentum white. Scutellum opaque, yellowish tomentose, that on the margin white, the bristles yellowish. Abdomen yellowish tomentose, and with a crossband of white tomentum at the base of each segment except the first, where the band is at the apex; dorsum of abdomen nearly destitute of pile, that along the sides rather abundant and white; venter snow-white tomentose and pilose. Legs white tomentose, the bristles reddish; hind femora each with two bristles and a few long hairs or weak bristles below; middle femora each with a single bristle in front and a fringe of white pile behind. Knob of halteres yellowish-white, the stalk darker yellow. Wings hyaline, apex of subcostal cell yellowish.

Male differs from the female as follows: Front with sparse, sub-depressed white pile. Tibiæ usually yellowish. Eyes meet each other for a short distance on the front. Hypopygium large, not dilated below, slightly longer than the last two abdominal segments, its sides and lower surface white tomentose.

Length 3 to 6 mm. Los Angeles, San Diego and Kern counties, Cal. Three males and seven females, in May and June.

I formerly regarded this as being a mere variety of cervinus

Loew, and described it as such, but there can be no doubt of its belonging to a distinct species.

APHOEBANTUS TARDUS n. sp.—Female. Black. Front and face gray pollinose, sparse yellow tomentose and black pilose. Proboscis not projecting beyond the oral margin. Antennæ with the first two joints sparse black pilose; styliform portion of the third joint once and a half as long as the thickened basal part. Occiput white tomentose, that above yellowish. Thorax yellow tomentose and sparse short white pilose, the bristles also white; pleura white tomentose and pilose. Scutellum sub-opaque, yellow tomentose, the bristles also yellowish. Abdomen yellow tomentose, that on apex of each segment white; dorsum very short sparse white pilose, that on the sides longer and more dense; venter white tomentose and pilose. Legs white tomentose, the bristles yellowish; hind femora each with two bristles but no long hairs beneath; middle femora each with one or two bristles in front and numerous rather long hairs behind. Halteres wholly light yellow. Wings hyaline, apex of subcostal cell yellowish.

Male differs from the female in having the pile of thorax and abdomen longer and more dense. Eyes meet each other for quite a long distance on the front. Hypopygium moderate, not dilated below, equal in length to the last two abdominal segments.

Length 5 to 9 mm. Los Angeles, San Diego and Kern counties, Cal. Four males and five females, in May and June.

APHOEBANTUS MARCIDUS n. sp.—Female. Black, the tibiæ and basi of tarsi yellowish. Front and face gray pollinose, sparse white tomentose and pilose. Proboscis not projecting beyond the oral margin. Antennæ lightly gray pollinose, sparse white pilose; styliform portion of the third joint equal in length to the thickened basal part. Occiput dense white tomentose and sparse white pilose. Thorax white tomentose and sparse white pilose, the bristles also white; pile and tomentum of pleura white. Scutellum opaque, white tomentose, the bristles also white. Abdomen white tomentose and rather abundant white pilose; ventor snow-white tomentose and pilose. Legs white tomentose, bristles of tibiæ reddish; hind and middle femora with many long hairs but no bristles below. Halteres yellowish-white, the stalk darker toward the base. Wings wholly hyaline.

Male differs from the female in having the tomentum of the front, thorax, scutellum and abdomen light yellowish, bristles of thorax and scutellum also yellowish. Eyes meet each other for some distance on the front. Hypopygium large, scarcely dilated below,

equal in length to the last two abdominal segments, gray pollinose except a large spot each side, the under surface white tomentose.

Length 8 to 9 mm. San Diego and Kern counties, Cal. A single male and female, in May and June.

APHOEBANTUS MIXTUS n. sp.—Female. Black. Front gray pollinose, sparse whitish tomentose and black pilose; face destitute of tomentum, gray pollinose and white pilose. Proboscis not projecting beyond the oral margin. Antennæ with first two joints sparse white pilose; styliform portion of the third joint equal in length to the thickened basal part. Occiput white tomentose. Thorax yellow tomentose and sparse black pilose, that on the front end yellowish, bristles reddish and black; pleura gray pollinose, the pile and tomentum white. Scutellum opaque, yellowish tomentose, the bristles reddish. Abdomen black, white and light yellow tomentose, the white forming a crossband on the hind end of segments 2 to 5; the black forming crossbands, interrupted in the middle, on segments 2 and 3, being intermixed with light yellow tomentum which is most abundant on the posterior half of the body, the last two segments being destitute of black tomentum; pile of dorsum very short and sparse, that along the sides longer but very sparse except on the first segment where it is quite dense, white; venter white tomentose and pilose. Legs white tomentose, the bristles yellowish; hind femora with two small bristles but no long hairs below, middle femora destitute of bristles and of long hairs. Knob of halteres whitish, the stalk yellow. Wings hyaline, apex of subcostal cell yellowish.

Length 6 mm. San Bernardino county, Cal. A single female, in July.

APHOEBANTUS INTERRUPTUS n. sp.—Female. Black, the tibiæ and base of tarsi yellowish. Front and face gray pollinose, destitute of tomentum; pile of front black, reddish and white, the latter situated nearest the antennæ; pile of face white. Proboscis never projecting more than one fourth the length of its labellæ beyond the oral margin. Antennæ with first two joints gray pollinose, pile above yellowish, that below white; styliform portion of the third joint equal in length to the thickened basal part. Occiput gray pollinose, sparse yellowish-white-pilose, next the eyes below white tomentose. Thorax yellow tomentose and sparse black pilose, that on the front end yellowish, bristles reddish and black; pleura gray pollinose and white tomentose, the pile yellowish and white. Scutellum rounded behind, polished black, the base and a median stripe reaching the apex yellow tomentose, the bristles black. Abdomen with first segment and base of the second white tomentose, the

remainder black and yellow tomentose, the black forming six interrupted crossbands; pile white, on sides of first segment very abundant, elsewhere very sparse; venter white tomentose and pilose. Legs white tomentose, that on apex of hind femora and on hind tibiæ yellowish; hind femora each with from four to eight bristles but no long hairs below; middle femora each with two or three bristles in front. Halteres dark brown, base of the stalk yellow. Wings hyaline, apex of the subcostal cell yellowish.

Male differs from the female in having only five interrupted crossbands of black tomentum on the abdomen, and there is a crossband of rather long white pile on hind end of segments 2 to 6. Eyes meet each other for a considerable distance on the front. Hypopygium very large, not dilated below, about equalling the last two abdominal segments in length, gray pollinose and very short sparse white pilose, destitute of tomentum.

Length 5 to 7 mm. Los Angeles county, Cal. Seven males and three females, in June.

APHOEBANTUS SCRIPTUS n. sp. Female. Black. Front gray pollinose, black pilose and sparse whitish tomentose; face gray pollinose, destitute of tomentum, black and reddish pilose, the latter situated nearest the mouth. Proboscis never projecting more than one-fourth the length of its labellæ beyond the oral margin. Antennæ with first two joints sparse black pilose; styliform portion of the third joint once and a half as long as the thickened basal part. Occiput white and yellow tomentose, the latter most abundant on the upper part. Thorax yellow tomentose and sparse black pilose, that on the front end yellowish, bristles black and reddish; pleura gray pollinose and white tomentose, its pile yellowish and white. Scutellum sub-opaque, yellowish tomentose, the bristles reddish and black. Abdomen with alternate crossbands of light yellowish and black tomentum, the black ones being five in number, the last or seventh segment being destitute of black tomentum; pile of dorsum very short and sparse, of the sides longer and that on the first two segments quite dense, white; venter white tomentose and pilose. Legs yellowish-white tomentose, the bristles reddish; hind femora each with three bristles but no long hairs below, middle femora each with three bristles in front. Halteres yellowish-white. Wings hyaline, apex of the subcostal cell yellowish.

Male differs from the female in having the black tomentum of the abdomen confined to a medio-dorsal spot on segments 2 to 6, the yellowish-white tomentum rather sparse, the dorsum and sides with quite long and abundant erect whitish pile. Eyes meet each other for a short distance on the front. Hypopygium rather small,

not dilated below, about three fourths as long as the last two abdominal segments united.

APHOEBANTUS DESERTUS n. sp.—Female. Black. Front and face sparse yellowish tomentose and erect black pilose. Proboscis not projecting beyond the oral margin. Antennæ with the first two joints sparse black pilose; styliform portion of the third joint once and a half as long as the thickened basal part. Occiput whitish tomentose. Thorax yellow tomentose and sparse black pilose, that on the front end yellowish, bristles reddish and black; pleura gray pollinose and white tomentose, its pile yellowish and white. Scutellum yellowish tomentose, the bristles reddish. Abdomen with alternate crossbands of black and whitish tomentum, the dorsum with scattered quite long black pile, the sides with denser white pile; venter white tomentose and pilose. Legs with the femora whitish tomentose, the bristles reddish; hind femora each with from one to five bristles and numerous long hairs below, middle femora each with four or five bristles below and with many long hairs behind. Knob of halteres light yellow, the stalk brown. Wings hyaline, apex of the subcostal cell yellowish. Length 9 to 10 mm. San Diego county, Cal. Two females, in May.

APHOEBANTUS CAPAX n. sp.—Female. Black, tibiæ and base of tarsi yellowish. Front sparse yellow tomentose, black and reddish pilose, the latter situated next the antennæ; face destitute of tomentum, golden-yellow pilose. Proboscis not projecting beyond the oral margin. Antennæ with first two joints sparse black pilose; styliform portion of the third joint equal in length to the thickened basal part. Occiput yellowish tomentose. Thorax yellow tomentose and sparse yellowish pilose, the bristles reddish; pleura gray pollinose and white tomentose, the pile yellowish and white. Scutellum yellowish-white tomentose, the bristles also yellowish white. Abdomen with alternate crossbands of yellowish-white and black tomentum, the dorsum almost destitute of erect pile, the sides very sparse pilose except on the first two segments where it is abundant, white; venter white tomentose and pilose. Legs yellowish-white tomentose, the bristles reddish; hind femora each with four bristles but no long hairs below, middle femora each with two bristles in front and a fringe of rather long pile behind. Knob of halteres yellowish-white, the stalk brown. Wings hyaline, apex of the subcostal cell yellowish.

Male differs from the female in having the pile of the front golden-yellow, of the first two antennal joints reddish, face sparse yellowish tomentose, pile of lower part of occiput white, tomentose crossbands of abdomen yellow and whitish, dorsum of abdomen

with crossbands of rather long erect pile on hind end of each segment, the sides quite abundant pilose. Eyes narrowly separated on the front. Hypopygium very small, not dilated below, almost concealed within the last abdominal segment.

Length 7 to 10 mm. San Diego county, Cal. A single male and female, in May.

Although differing from each other somewhat in the coloring of the pile and tomentum, still it is highly probable that these two forms are the opposite sexes of the same species; they were captured at the same time and place, are essentially alike in structure, and they are the only forms known to me in which the pile of the face is golden-yellow.

APHOEBANTUS ABNORMIS n. sp.—Female. Black, the tibiæ and tarsi reddish. Front yellowish-white tomentose and reddish or yellowish-white pilose; face white tomentose and pilose. Proboscis not projecting beyond the oral margin. Antennæ with the first two joints sparse yellowish-white pilose; styliform portion of the third joint equal in length to the thickened basal part. Occiput white tomentose, that above yellowish. Thorax yellowish-brown tomentose, that on the sides and front end white; bristles reddish; pleura white tomentose, the pile white and yellowish. Scutellum opake, yellowish-brown tomentose, the bristles numerous, reddish, some of them situated on the upper surface. Abdomen yellowish-brown tomentose, that on extreme apex of each segment lighter, apex of each segment with a crossband of short reddish pile, elsewhere the dorsum is almost destitute of pile; sides of abdomen short sparse reddish pilose, that on the first two segments longer, more abundant, white; venter white tomentose and sparse yellowish-white pilose. Legs white tomentose, that on the tibiæ mixed with yellow; the bristles reddish; hind femora each with four bristles but no hairs below, middle femora each with three or four bristles in front and a fringe of short pile behind. Knob of halteres light yellow, the stalk dark yellow. Wings hyaline, apex of the subcostal cell yellowish.

Male same as the female except the sexual characters. Eyes meet each other for some distance on the front. Hypopygium unusually large, laterally compressed, more than half as large as the abdomen, divided lengthwise into an upper and a lower piece, the latter scarcely one-fourth as large as the upper one which is curved downward; apex of each piece bifurcated, the prongs on one piece projecting toward those on the opposite piece; hind end of upper piece provided with an elongated, nearly perpendicular piece of a jet black color narrowly bordered with white; hypopygium opaque,

white tomentose and short sparse yellow pilose, the pile most abundant on the lower piece.

Length 8 to 9 mm. Orange county, Cal. Three males and two females.

The hypopygium of the male is very much larger than that of any of the other males described in this paper; when viewed from the side it has a close resemblance to the beak of a parrot.

APHOEBANTUS SQUAMOSUS n. sp.—Female same as above description of abnormis with these exceptions: Bristles of scutellum confined to the margin—none on its upper surface. Hind femora each with three or four bristles and numerous short hairs or weak bristles below.

Male same as the female except the sexual characters. Eyes meet each other for a considerable distance on the front. Hypopygium small, not dilated below, once and a half as long as the last, or sixth abdominal segment; opaque, white tomentose and sparse yellowish pilose.

Length 7 to 10.5 mm. Orange county, Cal. A male and female captured in coition.

APHOEBANTUS FUMIDUS n. sp. Male. Black, the femora, tibiæ and base of the tarsi reddish. Front and face sparse yellowish-white tomentose and pilose. Proboscis not projecting beyond the oral margin. Antennæ with the first two joints sparse whitish pilose; styliform portion of the third joint only half as long as the thickened basal part. Eyes meet each other for a short distance on the front. Occiput white tomentose. Thorax light yellow tomentose, forming three indistinct light colored vittæ where the tomentum is most dense; bristles reddish; pleura white tomentose, the pile white and yellowish. Scutellum opake, light yellow tomentose, the bristles weak and reddish. Abdomen light yellow tomentose, a crossband of white tomentum at apex of the first segment and a light colored one at the apex of each of the remaining segments; pile sparse but rather long, whitish, that along the sides more abundant and yellowish; venter white tomentose and pilose. Hypopygium rather small, scarcely dilated below, nearly as long as the last three segments united, opake, sparse whitish pilose, destitute of tomentum; lower piece hollowed out, like a trough, to receive the upper piece which rests in it and is cleft in the middle from apex to the base, each piece tapering to the tip; apex of lower piece obliquely truncated. Legs light yellow tomentose, the bristles also yellow; hind femora each with two bristles and numerous short hairs below and with a row of five or six bristles behind; middle femora destitute of bristles below. Knob of halteres light

yellow, the stalk darker. Wings hyaline, the base tinged with smoky brown, which color fills the costal and subcostal cells, basal half of the first basal cell and bases of the second basal, anal and axillary cells, the outward limit of the brown coloring not well defined.

Length 6 mm. San Bernardino county, Cal. Two males, in July.

APHOEBANTUS BREVISTYLUS n. sp.—Female. Black. Front gray pollinose, destitute of tomentum, its pile mixed black, reddish and white; face white pilose, destitute of tomentum. Proboscis not projecting beyond the oral margin. Antennæ with the first two joints white pilose, the styliform portion of the third joint once and a fourth as long as the thickened basal part. Occiput white tomentose. Thorax light yellow tomentose, the bristles yellowish white, pile of the sides, pleura, breast and coxæ white. Scutellum light yellow tomentose, the bristles yellowish-white. Abdomen with six alternate broad black and narrower light yellow tomentose crossbands the latter situated at the apex of each segment except the first, the black crossbands bordered on the sides with light yellow tomentum beneath which and on the venter the tomentum is white; pile of dorsum very sparse, that on first segment, sides of remaining segments and on the venter rather abundant, white. Legs white tomentose, hind femora each with two bristles but no long hairs beneath, middle femora each with one or two bristles in front. Wings, except apex of subcostal cell, wholly hyaline. Halteres yellow, the knob largely dark brown.

Length 6.5 to 8 mm. Los Angeles county, Cal. Two females, in June. *D. W. Coquillett.*

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## *THE CONVOLVULUS.*

The morning glory is a flower,
With smiles of welcome beaming,
In red or white or blue arrayed,
'Tis still of beauty dreaming.

Oft I say to it, 'good morning,'
It really is so winning;
With its companionship, the day
In glory makes beginning.

*Mrs. E. E. Orcutt.*

## *NOTES ON PLANTING.*

One of the most conspicuous vines of Honolulu is the Bougainvillæa. It is seen growing all over a barn, a whole side of a house or to the top of some tall tree. To keep it within bounds is a care, so rank a grower is it in the tropics.

This vine is a very interesting plant, brilliant with its profusion of rich magenta flowers, that are really not flowers at all, but only large bracts about the three small tubular cream colored flowers. At San Diego the Bougainvillæa is more common than at any other place in Southern California. At San Francisco and the east it is only grown in the conservatory, and therefore is very attractive to the visitors here. There are three varieties, all natives of Brazil and in cultivation for about thirty years.

The commonest and oldest variety in San Diego is the B. speciosa, having very wooly leaves, and blooming during the winter. This sort is very hard to propagate and does not bloom freely until three to four years old. B. glabra has a bright, glossy green foliage, is as rank growing and blooms early and freely, and is virtually an ever-bloomer, but the flowering is most profuse during the summer.

Owing to the dazzling magenta color of the flower and the profusion of the bloom, this vine is a trying one for a small garden, as every shade of red and pink in the vicinity is ruined.

It should be planted apart from other vines and given a whole veranda, trellis, barn or side of a house—even to the top—or an arbor at the back of the lawn or among trees. Don't discard the Bougainvillæa, but put it in the right place, and you will have a plant of oriental splendor. If other vines are planted near by, select the white flowering sorts.

Palms are one of the most decorative and lasting of plants in cultivation and should receive a great deal more attention than has been given or thought of thus far by those planting in San Diego. The order being pre-eminently tropical in its distribution, every sort that can be grown here should be cultivated, for they give to our gardens a feature never possible in the cooler climates.

Palms are not difficult of cultivation, but they need good drainage and an abundant supply of water and considerable enriching during the summer, their growing season. It is always best to plant about April, rather than during the winter and they should be established in boxes or pots if the best results are desired. Young and thrifty palms are better than old and large ones, for the latter suffer so much in transplanting that it often requires years to overcome the effects.

One of the hardiest and most effective of these dwarf palms is the Cycas revoluta, the extensive cultivation of which by the Japanese, the most artistic gardeners of the world, is one of its best recommendations. At the Coronado hotel court are two plants, three to four feet high, standing in the extreme southeast and southwest corners of the court.

Though choice plants when set they have made a remarkable growth, and are now exceptionally handsome specimens. One has just thrown up a flower stalk over one foot high, and the plants will be most interesting during this summer, and well worthy of close observation. Such plants in boxes could not be duplicated in California for less than $100 each. The value of this palm is rated by the height and diameter of the trunk as well as by the condition of the foliage, and when exported from Japan are sent bare of leaves and sold by the pound. It requires about three years for a small plant to become well established, and after that the growth is quite rapid.

Seaforthia elegans is a beautiful palm, well known by all lovers of decorative plants, and extensively grown in all large conservatories in the east and Europe.

It grows with a slim, bare trunk, free from leaf scars, the huge, graceful, plume-like leaves growing only from the top. It occupies, even when large, only a small amount of ground space, towers high and casts but little shade. This palm thrives well in the open air in San Diego and is deserving of extensive cultivation. As sheltered a location as possible is best, for the wind will often whip and break the pinnae of the large leaf.

Seaforthia robusta is an equally handsome palm and is shown by but one beautiful plant in the Hotel Coronado court. It bears more leaves and does not have as tall a trunk as S. elegans. The leaves are very beautiful and graceful like plumes and are not easily broken by the wind.

After observing these two sorts of seaforthias in the Coronado hotel court, as they grow side by side, turn to the two Royal palms, on either side of the fountain there growing. They were brought from Honolulu when the stems were about six inches in diameter, and in three years you can see the change. They are a very fast growing palm and the larger one is now the tallest plant in the court. At Honolulu the sky is fairly brushed with their regal plumes.

Lower California and her Pacific islands are the home of three handsome fan palms, all to be seen growing luxuriantly in this city, and are well worth attention and study.

The Washingtonia filifera, the common fan palm, is so named on account of the thread-like filaments hanging from the fans and most conspicuous on the young growth. The oldest specimens are in the gardens of Mr. W. W. Stewart and Mr. E. W. Morse. They are not over twenty years from seed. Within a few years the double row on Orange avenue, Coronado, will be one of the sights of Southern California, every plant perfect and none missing to mar the symmetry.

This variety is better for large grounds, avenue and park cultivation than for small gardens, where some of the rarer and slower growing palms are more desirable. In its native home it is found in canyons along the water course.

The Guadalupe islands palm or Erythea edulis is so named because of the edible fleshy pulp above the nut. This sort has very large, smooth, dark green fans and is more spreading in habit than the common fan. It is very beautiful, and more graceful when allowed plenty of room and should be grown extensively in parks and on lawns.

Erythea armata, the blue palm, grows in canyons on the desert side of the mountains, about thirty miles below the U. S. boundary line. It is one of the most beautiful of cultivated palms, its very slow growth being an advantage. The delicate grayish blue color of its foliage and stems makes it a most effective palm for the lawn or for grouping with contrasting foliage and its cultivation in small yards should be much more extensive. The largest plants in the city are at Mr. E. W. Morse's, and are about fifteen years old. This sort is difficult to transplant unless set from a pot or box.

All of these three native palms are grown from the seed, which usually germinates in three to twelve months when sown in the open ground. The blue palm seed sometimes takes three years in which to germinate!

The summer or growing season is the only time of year when the palms need care, plenty of water and enriching. As a rule the plants are trimmed too severely. Unless a leaf is dead or broken it should not be removed.

The Ficus or fig family is a large and useful one, furnishing the fig of commerce, the India rubber producing tree of the tropics and not a few ornamental trees and shrubs. If you will observe the large rubber tree on Eighth street, between C and D, on the east side, with its large dark green leaves and strong, substantial trunk, and then compare the shrubby tree directly opposite on the west side with similar but smaller leaves quite a lesson can be learned. The former is the Ficus macrophyllum (meaning large leaf) or the

Australian rubber tree often called the Moreton Bay fig. This does not produce the rubber of commerce, but it is one of the grandest trees in cultivation where a large and spreading shade tree is needed. The smaller leaved variety is Ficus australis and is more desirable for a large shrub and for grouping than for shade.

The Australian rubber tree is planted extensively on the sidewalks and roadways of Melbourne, a city famous for her magnificent avenues. On the park charity tract last spring a double row of 100 of these trees was set, which, I believe, is the only long avenue of them in the state. The cost has been a drawback to extensive planting, while the climate of northern California is too severe for successful cultivation on streets. Ten years hence these rows will form grand avenues of shade, fully fifty feet high.

The best Ficus for planting within the gardens of the city, unless the grounds are spacious, is the true India rubber tree, the ficus elastica. It is of smaller growth yet, branching with the most beautiful foliage of all the rubbers, shading from the darkest green to russet brown. *Miss K. O. Sessions.*

## *APRICOTS.*

California is peculiarly adapted for the growth of the apricot. Although the apricot has been grown here from the earliest days of the American occupation, and though since the opening of the export trade in canned and dried fruits, the planting of apricot orchards has proceeded with great rapidity, present indications are that our distant patrons are only just beginning to recognize the desirability of the fruit, and that their demands will make it well-nigh impossible for us to extend our production beyond profitable limits.

The apricot is comparatively a long lived tree as well as a rapid grower and heavy bearer in California. A paying crop is usually secured the third year from planting. As a windbreak the apricot is a complete success. Most all trees shrink away from the trade-winds but the apricot leans a little toward it and is thickest of foliage on that side. Where the pits are sown in a row and the young seedlings thinned to about a foot apart in two years' time a hedge and windbreak will be produced that will withstand any ordinary wind.

Of all California orchard trees the apricot needs more attention in the way of pruning than any other.

It is a rampant grower, and in its zealous haste for size and fruitage it over-reaches itself and becomes the prey of specific gravity

and wind force. This excessive growth and consequent weakness of the apricot is greater in some parts of the state than others because of the indifference in degree of forcing conditions, but everywhere the apricot needs watchfulness and timely aid in building up its strength. Space forbids us going into details in regard to pruning this valuable tree. But we advise any one who seeks a knowledge of the business to purchase a copy of 'California Fruits', as it is a thorough treatise on this desirable fruit. We herewith give descriptions of a few choice varieties:

ROYAL:—A French variety and at present the leading apricot in California; of large size, if well thinned, free stone, fine color and flavor; good bearer and ripens evenly. A favorite with the canners and an excellent variety for drying. Fruit roundish, large, oval, slightly compressed; skin dull yellow with orange check, flesh pale orange, firm and juicy with a rich vinous flavor.

BLENHEIM:—A very good variety, above medium, oval; orange with deep yellow, juicy and tolerably rich flesh; vigorous grower and regular, prolific bearer, Fruit a little larger and ripens a little later than the Royal.

EARLY GOLDEN:—Small roundish oval with suture well marked and extending half way around; skin smooth, pale orange, flesh yellow, with very good flavor, free stone; ripens before Royal.

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## *CONTRIBUTIONS TO WEST AMERICAN MOLLUSCA.—II.*

The object of this series of papers is to collect, and present in connected form, stray notes and observations on the mollusca of West America, with full biographical references and synonymy.

### PUPIDAE.

PUPA DALLIANA Sterki, Nautilus, iv. 19. Clear lake, Lake Co., Cal. (Hemphill). Named in honor of Wm. H. Dall, of the United States National Museum.

PUPA CALIFORNICA Rowell. San Francisco to Monterey, Cal.

PUPA CALIFORNICA TRINOTATA Sterki, Nautilus, iv. 18. Monterey, Cal. (Hemphill).

PUPA CALIFORNICA DIEGOENSIS Sterki, Nautilus, iv. 18. San Diego, Cal. (Hemphill).

PUPA CALIFORNICA CYCLOPS Sterki, Nautilus, iv. 18. Rocklin, Placer Co., Cal.

PUPA CALIFORNICA ELONGATA Sterki, Nautilus, iv. 8. San Clemente island, Cal. (Hemphill.)

PUPA CALIFORNICA CATALINARI Sterki, Nautilus, iv. 8. Santa Catalina island, Cal. (Hemphill).

PUPA CALAMITOSA Pilsbry, Proc. Acad. Nat. Sci., Phil., 1889, p. 411. Near Santa Tomas, Lower California (Hemphill). San Diego, Cal. (Orcutt.)

PUPA STERKIANA Pilsbry, Proc. Acad. Nat. Sci., Phil., 1889, p. 412. Near San Quentin bay, Lower California, on lichens (Orcutt). Distributed as P. chordata Pfr. by the writer. The largest known West American species.

PUPA HEMPHILLI Sterki, Nautilus, ix. 27. Near Santa Tomas, Lower California, and San Diego, Calif. (Hemphill).

PUPA ROWELLI Newcomb. Near Oakland, Monterey, San Bernardino, and in El Dorado county, Cal. (fide Binney).

PUPA ARIZONENSIS Gabb, Amer. Jour. Con. ii. 331. Ft. Grant, Arizona; Nevada; Utah.

PUPA HORDACEA Gabb, Amer. Jour. Con. ii. 331. Ft. Grant, Arizona.

PUPA ORCUTTI Pilsbry, ined. Near San Quentin bay, Lower California, on lichens (Orcutt).

PUPA CORPULENTA Morse. Nevada; Colorado.

PUPA ALTICOLA Ingersol. Colorado. *C. R. Orcutt.*

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## *PHACELIA CAMPANULARIA.*

This California annual has received a first-class certificate from the Royal Horticultural Society of England, where it was introduced a few years ago through Messrs. Parish. In habit it resembles the well known Phacelia Whitlavia (Whitlavia grandiflora of seedsmen), but it has a more spreading and bushy habit of growth and produces a greater abundance of flowers. The campanulate flowers are large and numerous, violet purple or deep gentian blue, produced in terminal racemes of from twelve to twenty or more flowers which are developed in succession. Each flower is about three fourths of an inch across, of an erect campanulate form, with a spreading five lobed limb, and a short funnel shaped tube, marked in the throat with fine oblong white spots. An average plant will cover nine square inches of ground in cultivation according to an English grower.

Its greatest attraction rests on its large and numerous satiny blue flowers, of a shade rivaling that of Salvia patens. It is a native of Southern California, where it was first found, in the mountains back of San Diego, by Daniel Cleveland and described by Dr. Asa Gray in his Synoptical Flora of North America, vol. ii, p. 164.

## *A LETTER FROM DR. GEO. ENGELMANN TO DR. C. C. PARRY.*

St. Louis, Mo., Jan. 10, 1883.

Dear Parry: If you really leave the 15th these lines will scarcely reach you, but they will greet you on the return from a glorious trip. Thanks for the Cactus seed and Rose.

You complain of my not writing—I think I have been doing nothing in all December but writing to you; at all events I wrote on the 27th which you ought to have had when you wrote last. My letter of the 19th has been already answered—I got yours on the 5th. You see that the Rose has made sensation in Rose circles and will, no doubt, be highly prized by cultivators, but whether you will be able to get it to Europe alive?

I have been overhauling Plantago lately. You sent me Plantago Bigelovii from near San Diego some time ago. The small slender thing is correct, but there was another bigger woolly headed thing mixed with it, which is nothing but P. Patagonica, a dwarf form.

When will I publish Cereus? Perhaps in the next world—for I see no possibility to get at it soon, and my time here may soon be out! What a mess of unfinished business will I leave behind.

Remember me to Cleveland. I suppose he has got my Boundary Cactaceæ now.

So you will take the ladies along! Remember me kindly to both of them; I will be with you in spirit! I have only a few days ago handled Euphorbia misera which Miss Smith helped me gather on Point Loma two years ago. My herbarium is not only a source of scientific delight, but the best journal I could have; every specimen brings scenery and surroundings up like a magic lantern. There are the bushes of E. misera, and there the curious sea formations, and there Miss Smith and her father, and up and far west of us the lighthouse—and then the lunch—Oh, it was nice! But the big stick of Opuntia prolifera I could not master with my knife—could you with an ax get one! Between old and new San Diego I believe I have seen them four or five inches thick.

And now good luck for your trip. Will you also settle Agave Pringlei. Yours ever, *G. Engelmann.*

[The above letter will be read with interest by many botanists, and is reproduced by permission from the correspondence of the late Dr. Parry. The rose referred to is Rose minutifolia, a remarkable new species discovered by Dr. Parry and others in Lower California in 1882. The charming reference to the pleasures derived from the possession of an herbarium will be appreciated by every collector.—Editor.]

## *COBŒA SCANDENS.*

(From *Vicks Magazine*, xiv. 250.)

On account of its rapid growth Cobœa scandens is one of the best of climbing annuals. It has attractive foliage and large, bell-shaped flowers which are, at first, of a greenish hue, changing rapidly to purple. The plants commence to blossom when quite small, and continue until frost. Under favorable circumstances they make an immense growth, sometimes making a height of twenty-five or thirty feet in a season. The seeds are hard to germinate and should be started in the house. Make the soil moist and plant the seeds edge downwards, and give no water until the seedlings are up, unless the soil in which they are planted becomes very dry. Sow seeds in March or April, and as soon as the plants are large and strong enough, remove a part of them to small pots and keep shaded a few days. As the weather grows warm gradually accustom them to out-door air, and plant out when all danger from frost is past. The soil where they are to grow should be well and deeply worked with plenty of old manure added. In dry weather water liberally, and an occasional watering with liquid manure will help them 'rush' business. Some people remove the plants from the garden, where they have done duty all summer, to the house for winter blooming, but a better way is to plant seed in August for winter blooming, or secure young plants by layering, which can be done at almost any time of the year by the following method: 'Cut a notch near a joint, place in a pot and fill with soil and keep the soil moist.' They will be from two to four weeks rooting. It is a fine vine for parlor growth, withstanding the effects of gas and coal-heated air. It is not what can be called a tender plant, yet it needs sunshine, warmth, a rich, friable soil and plenty of water. If allowed to suffer for the want of water it will soon perish. Its tendrils are very clinging and will seek to support themselves by clinging to anything it can reach. It branches very freely, thus enabling a single plant to quickly cover a large surface. *Dorothy Lincoln.*

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## *WEASELS AS GOPHER AND SQUIRREL EXTERMINATORS.*

An article has been going the rounds of the newspapers in Southern California to the effect that weasels were used in some places for the extermination of squirrels and gophers. Thus being brought before the public, the qnery has been, are they a success, and if so, how can they be handled so as to be of the most benefit? The success with us has been very gratifying, as until about one

year ago gophers were very numerous all through our nursery, and an unused dwelling was literally alive with mice. When all at once, as if by magic, the mice left the building as we thought. We could see that the gophers were getting scarce, and in irrigating the water would run clear through the lot, where before the gopher holes were a great annoyance. About the same time weasels were seen occasionally skipping along through the nursery rows or down over the hillsides near the nursery, and frequently little squads of from two to four would be seen together. They could be seen to dive into an open squirrel hole and there remain some time.

Only one conclusion could be arrived at in noticing the actions of the weasels and the disappearance of the squirrels, and that is that the weasels have killed the squirrels. Such being the case we have not molested them, and they seem content in the killing business.

Without a doubt we have proved that the weasels are killing off the gophers and squirrels around our place, but unless the weasel will migrate of his own accord and look for new fields to conquer he may get to be as big a nuisance as the vermin he has just vanquished. At some future time I may be able to give more information. *L. C. Cummins.*

## *PLANTÆ CULTERATÆ EXSICCATÆ.*

We take pleasure in announcing the commencement of the publication of a series of the useful and ornamental plants of the world, especially of those known in, or recommended as worthy of cultivation.

It is our aim to grow each species in San Diego, and to prepare herbarium specimens that shall completely represent the species included in the publication. The specimens will be prepared with great pains, under the direction of C. R. Orcutt, who has enjoyed personal instruction in this line of work from such botanists as the late Drs. Asa Gray, George Engelmann and C. C. Parry, and of that prince of collectors, Mr. C. G. Pringle, and whose specimens during ten years of active field work have given satisfaction to the conservators of many public and private herbaria.

Labels will give botanical and vernacular names, country of nativity (when known), general description (drawn from the fresh plant), colors described by actual comparison with Ridgway's Nomenclature of Colors, historical, economic and cultural notes—in fact, all the information necessary to render the representation of the species complete.

The price of the first century is placed at $10.00 (unmounted). Specimens will be carefully mounted for the herbarium at a moderate advance. Published only by subscription. Fleshy parts of flowers, and fruits, will be preserved in alcohol when desired.

Sections of ligneous plants made upon request.

Living plants and seeds of all commercial species supplied; while we anticipate the introduction of many interesting species worthy of cultivation through the efforts of our collectors in Mexico, Central and South America, and elsewhere.

Cultivated plants are usually neglected in herbaria and we trust our efforts in this direction will be appreciated by educational and scientific institutions, and that all interested in botanical or horticultural science will improve this opportunity and lend assistance to the work. *Orcutt Seed and Plant Company.*

San Diego, California.

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## *A WOODLAND SCENE.*

Roses wild and rushing waters,
Made a refreshing place,
Here the cedar bird came to drink,
The fawn to see its face.

Blue was the sky above them all,
The stars not far away,
And weary Peace might here have slept
Through all the livelong day.

Far from human pride and sorrow,
Dreamy was e'en the air,
But soon the woodman's axe was heard,
That opened a path to Care!

The rushing waters fled amazed,
Some feeble waves were caught,
And to man's way obedient
Were in his service taught.

The cabin and the busy mill,
Grew where the fawn had stood,
The wild rose and the cedar bird
Came no more to the wood.

*Mrs. E. E. Orcutt.*

## *SAN FRANCISCO MICROSCOPICAL SOCIETY.*

[We are indebted to Mr. William E. Loy, the able recording secretary, for the following account of an instructive exhibition given by this society August 19, 1891.—EDITOR.]

A. H. Breckenfeld showed a beautiful live water spider, order Arachnidæ, genus Hydrachnea, on a dark field, which attracted a great deal of attention. Henry C. Hyde gave a pleasing exhibit of diatoms, one slide showing one hundred different species of naviculæ, mounted in styrax. S. E. Taylor showed a single frustule of a species of Arachnoidiscus, a beautiful genus of diatoms, with a low-angled half-inch objective and dark field illumination. L. M. King had on his stand an arranged slide of diatoms prepared by Rinnbock of Vienna. Charles C. Riedy exhibited a Navicula lyra with a one-fourth inch apochromatic objective and dark field.

R. H. Freund showed the only preparation of bacteria on exhibition, a species of pathogenic bacteria not identified. E. S. Runyon had a number of very attractive crystals, including the crystalizable principle from the prickly pear, Platino-cyanide of magnesium and Menthon crystals, all shown with polarized light and excellent effect. William E. Loy showed a young star-fish, Asterium gibbosa, with the aid of a spot lens.

The exhibition was further enhanced by brief informal addresses. Mr. Hyde gave an outline history of the Diatomacæ, showing first their place in botany, how generally they are dispersed about the globe, where they may be found, and a comparison of the fossil and recent forms. The peculiar structure of the diatom has preserved very perfect skeletons from the earliest geologic eras in which it is found, and when properly treated these fossils may be cleaned and mounted, yielding the most beautiful of all microscopic objects. He remarked that since the time of Ehrenberg many scientists had spent years of patient study in this captivating field, so that to-day many thousand species had been figured and described. Unlike some objects in nature, new beauties are seen with increased amplification, and the highest powers of the microscope only serve to increase the admiration of the beholder.

A. H. Breckenfeld gave a brief demonstration of the optical qualities of what is known as dark-field illumination. By this method the light is thrown around and upon the object, but its rays do not enter the objective nor reach the eye of the observer. The object then is shown on a dark back-ground, with a brilliancy not possible where the light passes directly through the object. His remarks were fully illustrated by drawings on the blackboard, and proved instructive and interesting. *William E. Loy.*

## *CALIFORNIA FIELD NOTES.*

During the spring of 1889 I made a few field notes which it may be well to record without waiting to incorporate them into a more complete treatment of the respective plants. The colors mentioned were named by Ridgeway's Nomenclature of Colors from actual comparison in the field. Hookera minor, a common bulbous plant on our mesas, had the segments of the flower colored a royal purple with the tube of a perianth white. Hookera Orcutti, a new and lovely lilaceous plant, first discovered in 1882 and later in 1884, possesses a white perianth, the tips (and sometimes nearly the whole) of the segments lightly tinged with lavender, shading into a deep lavender to a royal purple. Allium serratum, a richly colored wild onion, has outer segments and the tips of the inner segments of the perianth a phlox purple, the base of the inner segments white. Allium unifolium, another pretty wild onion, has rose or purple-colored anthers and stigmas and bore from fifteen to fifty-five flowers (by actual count) in a single umbel (the latter umbel of flowers measuring four inches across). The flowers are pure white, tinged with rose on the outside along the midrib. The bulbs are one to three inches deep; the flower stems from three to fifteen inches in height; and the two or three leaves one-eighth to one-half inch wide and six to fifteen inches long. Zygadenus Fremontii, has a bulb buried three to five inches deep with leaves one-fourth to one inch wide and nine to eighteen inches long, and four or five in number. The flower stem varies from six to twelve inches high, bearing flesh-colored flowers with a greenish-yellow center. *C. R. Orcutt.*

## *LIBRARY CATALOGUE.*

(Scientific books and periodicals may be ordered through our Book and Subscription Department.)

Recent accessions to the library of the West American Museum of Nature and Art will be catalogued monthly.

4132. Mandioca. By Thomas Morong. Reprinted from Bulletin of Pharmacy, June, 1891. From the author.

4133. Proceedings of the 16th annual meeting of the Amer. Association of Nurserymen, held at Minneapolis, Minn., 1891. Published by the Association. 160 pp, 8vo. 7 plates.

4144. The birds of Indiana, with illustrations of many of the species. By Amos W. Butler. Originally published in Trans. Ind. Hort. Soc., 1890. 135 pp. 8vo.

4145. American Society of Florists. Proceedings, 1886.

4146. Same, 1887.

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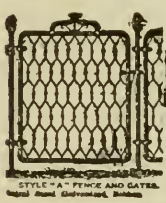


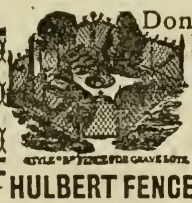


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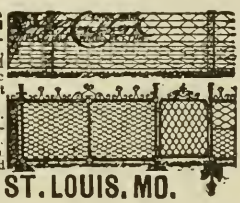

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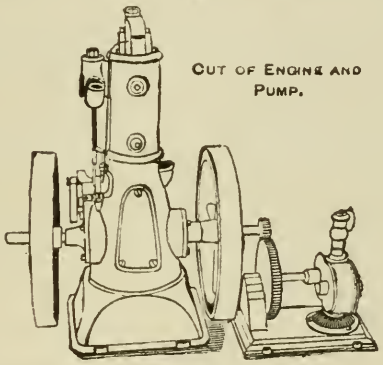

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